

## Claims

- [c1] A method of scheduling data transmissions in a wireless data network, comprising:
- (a) receiving a request to transmit data of a size  $s$  to a receiver;
  - (b) using the request size  $s$  and transmission characteristics to the receiver to select overall power and number of codes to assign to the request over an entire schedule;
  - (c) rounding results from step (b) so that every selected code is assigned a power that achieves a feasible data rate; and
  - (d) allocating the results of step (c) in each scheduling frame in accordance with a quality of service metric.
- [c2] The method of claim 1 wherein the overall power and the number of codes is selected using resource augmented competitive analysis.
- [c3] The method of claim 2 wherein the overall power  $p$  and the number of codes  $k$  is selected to minimize the following expression:
- $$\frac{p_l^c}{P} + \frac{k_l^c}{C}$$
- where  $P$  is the total power that can be transmitted and  $C$  is the total number of codes that can be assigned to receivers in a time frame in the schedule..
- [c4] The method of claim 3 wherein  $p$  and  $k$  are selected with respect to a resource-augmented demand.
- [c5] The method of claim 1 wherein the quality of service metric comprises minimizing maximum response time of data transmission.
- [c6] The method of claim 1 wherein the quality of service metric comprises minimizing a weighted response time of data transmission.
- [c7] The method of claim 1 wherein the quality of service metric comprises maximizing stretch of data transmission.
- [c8] The method of claim 1 wherein the quality of service metric comprises maximizing flow of data transmission.

- [c9] A method of scheduling data transmissions in a wireless data network, comprising:
- (a) receiving a request to transmit data of a size  $s$  to a receiver;
  - (b) using the request size  $s$  and transmission characteristics to the receiver to select overall power and number of codes to assign to the request over an entire schedule, such that the power  $p$  and number of codes  $k$  minimizes the expression
 
$$\frac{p_j^c}{P} + \frac{k_j^c}{C}$$
 where  $P$  is the total power that can be transmitted and  $C$  is the total number of codes that can be assigned to receivers in a time frame in the schedule; and
  - (c) allocating the results of step (b) in each scheduling frame in accordance with a quality of service metric.
- [c10] The method of claim 9 wherein  $p$  and  $k$  are selected with respect to a resource-augmented demand.
- [c11] The method of claim 9 wherein the quality of service metric comprises minimizing maximum response time of data transmission.
- [c12] The method of claim 9 wherein the quality of service metric comprises minimizing a weighted response time of data transmission.
- [c13] A method of scheduling data transmissions in a wireless data network, comprising:
- (a) receiving a request to transmit data of a size  $s$  to a receiver;
  - (b) using the request size  $s$  and the transmission characteristics to the receiver to select a number of codes needed to complete the request using a power of  $P/C$  per code assuming a reduced demand; and
  - (c) rounding results from step (b) so that every selected codes is assigned a power that achieves a feasible data rate; and
  - (d) allocating the results of step (c) in each scheduling frame in accordance with a quality of service metric.
- [c14] The method of claim 13 wherein, if a request satisfying the quality of service metric leaves unused power/codes in that scheduling frame, then another

request is packed into the scheduling frame.

- [c15] The method of claim 13 wherein the request with an earlier release time has higher priority over other requests.
- [c16] The method of claim 14 wherein, if the request with the earliest release time leaves power/codes unused in that scheduling frame, then another request is packed into the scheduling frame.
- [c17] The method of claim 13 wherein the request with a highest value of power per code has higher priority over other requests.
- [c18] The method of claim 17 wherein, if the request with the highest value of power per code leaves power/codes unused in that scheduling frame, then another request is packed into the scheduling frame.